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工学系学生国際交流基金報告書

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所属専攻・研究室・学年：国際開発工学専攻　神田研究室　修士2年	
派遣先大学・専攻： Melbourne University, School of Earth Science 受入教員名： Prof. David J. Karoly	
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研究（プロジェクト）題目： Analysing similarity of models and observation correlation with ENSO	

- 帰国後1か月以内に工学系国際連携室宛（ko.intl@jim.titech.ac.jp）にMS Wordファイルにて提出ください。
- SERPで派遣された場合は、受入教員の評価書も添付して下さい。
- この表紙を含まず、ページ数は2～4ページ、ファイルサイズは3MB以内としてください。
- 研究室や宿舎内の様子の写真、図表、イラスト、滞在中のその他の写真などは挿入可です。ただし、それらを掲載する際には簡単な説明を加えて下さい。
- 提出された報告書の2ページ目以降を工学系のホームページに掲載いたします。また、別途、クロニクルへの執筆をお願いすることがあります。

報告書必須記載事項
- 派遣大学の概要（所在地、創立、大学の規模など）
- 所属研究室での研究概要とその経過や成果、課題など
- 所属研究室内外の活動・体験（日常生活・余暇に行った事など）
- 留学先での住居（寮、ホームステイ等)、申し込み方法、ルームメイトなど
- 今回の留学から得られたもの、後輩へのメッセージ、感想、意見、要望

東京工業大学大学院理工学研究科

工学系学生国際交流基金報告書

派遣年　：　平成27年

氏名　：　Darmanto,Nisrina Setyo

所属専攻　：　国際開発工学専攻

派遣先　：　メルボルン大学

（次ページ以降に記入してください。）

AOTULE – University of Melbourne Report:

From November 7th until December 25th 2015 (including flight time), I was doing exchange program in University of Melbourne, Australia, School of Earth Science. This exchange program is under AOTULE agreement between Tokyo Institute of Technology and University of Melbourne. Since I am a student of MEXT scholarship, AOTULE waived my return-trip ticket of Haneda-Melbourne and Melbourne-Haneda. Later, accommodation and living cost is my own responsibility as stated on the agreement of dispatch.

Being a master student, I did not take any course during my exchange, otherwise, during my stay in University of Melbourne, I did a research on "Analysing similarity of models and observation correlation with ENSO" under supervision of Prof. David J. Karoly and his assistant Dr. Andrew King. My working time is from 10:00 to 18:00 from Monday to Friday, thus I can spend the weekend for leisure. This condition is pretty similar with Kanda's laboratory where I belong to. This research is fairly connected with my current research in Tokyo Tech, which will be beneficial for improving my research focus here. I would like to express my gratitude for AOTULE for this opportunity of being AOTULE exchange program student, so I was able to study future climate prediction model assessment from one of the best professor in Australia's climate change. I am sure that through this program, I got plenty of knowledge and fundamental concept of doing my next-step research goals.

Research summary:

From the recent CMIP5 Global Circulation Models (GCMs), there are many model options to be used for further regional scale climate projection. Hence, we need to choose which models are appropriate and "better" than other models in representing climate indices in our region of interest. There are many ways to choose these "better" models: (1) Analysing seasonal long-term mean climate indices in the region of interest from models and observation, (2) Analysing variability of seasonal climate indices or the standard deviation of seasonal long-term mean climate indices in the region of interest from models and observation, and (3) Analysing similarity of models and observation correlation with ENSO. In this works, we focused on point (3) as research objective and method in choosing models to be applied in regional climate model.

This work concludes that there is no fit-for-all models to be applied in a regional model, in this case the region of West Indonesia. However there are some models which has better performance and similar pattern with observation on ENSO correlation. In this work, GFDLCM3 and IPSL-CMA5-LR have the most similarity in showing ENSO correlation pattern with observation, next we have MIROC5, HadGEM2, and CanESM. Whereas MPI-ESM-LR has the lowest similarity among all (Figure 1). For future works, since we still cannot clearly defined which model to be ensemble, we need to assess these models through analysis (1) and (2) as mentioned in before.

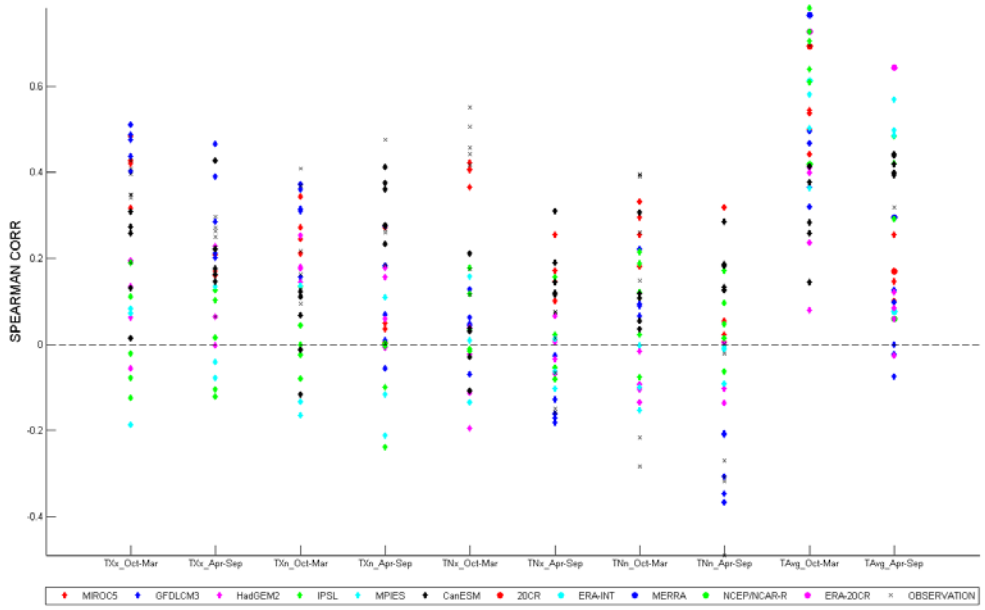

Figure 1 Spearman correlation on CMIP5 models capability on predicting ENSO in West Indonesia

Melbourne daily life:

Melbourne is second biggest city in Australia after Sydney. The city centre itself is not as big as Tokyo, probably similar to Shinjuku and Shibuya area combined together. It was really convenient to walk inside the city or taking tram. Since my accommodation is in the suburban area, I need to commute using tram to university (Figure 2). The daily living cost is similar with Tokyo but at some points, it was more expensive than Tokyo. For example, a bottle of mineral water can cost around 3.5 AUD (~300 JPY). Melbourne University's canteen meal for lunch is more expensive compare to Tokyo Tech but with bigger portion, then, it was a trade-off of higher price.

I was staying at my friend's house during this program. It was a share house in suburban area, 12 minutes away from university using tram Route 55. There were 4 people in the share house –all Indonesians- and it was really nice atmosphere. Mostly I spend my weekend with my Indonesian friends from University of Melbourne or the other university in Melbourne (i.e., Monash University and Royal Melbourne Institute of Technology). Some days, I also gathered with some Australian's friend and was invited to play Footy –Australian's American football- (Figure 4).

My insights about Australian's people are they are warm and friendly, even they will talk to stranger like me in some chances. It is easy to make friends with Australian people, especially if you put yourself inside their community. They are very respectful on heterogeneity, thus it is common to see many people from many countries in the world strolling around Melbourne city. Melbourne city and Melburnians –how Melbourne people called- is very respectful on religion even though most of the people does not have any religion. Hence, as a moslem, it is very convenient for me to find Halal foods around the city. Kosher foods for Jews and vegetarian food is also easy to find around Melbourne. There is no doubt that Melbourne is awarded as the most liveable city in the world.

Figure 2 Tram for commute (left) and University of Melbourne main gate (right)

There are plenty sightseeing spots around Melbourne city centre. What I like the most is the central city library (Figure 3) with calm atmosphere or Victoria market where we can buy cheap groceries and Australian's souvenirs (Figure 3). These two places are just 20 minutes walking from University of Melbourne.

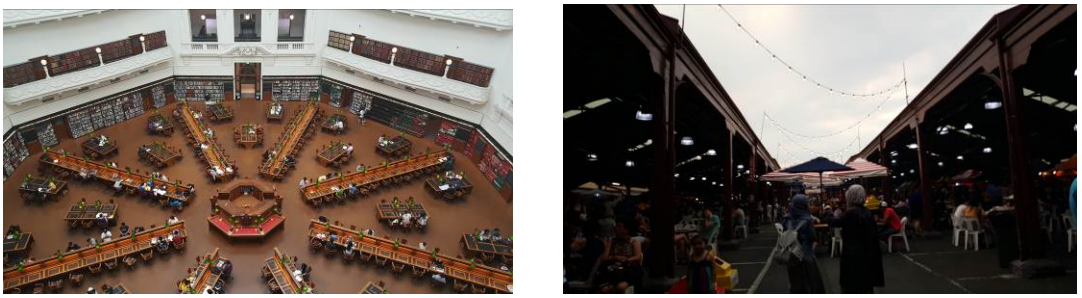

Figure 3 Melbourne city central library (left) and Victoria market's Wednesday night market (right)

Outside Melbourne city, many locals and tourists would like to spend their weekend around Victoria sightseeing spots like The Phillips Island, The 12 Great Apostles on Great Ocean Road, or beaches around Victoria. Since it was summer during my stay in Melbourne, it was really nice to visit beaches like the infamous Victoria Brighton Beaches with its line of summer huts (Figure 5). Also, Victoria is plenty of native Australian animals such as Kangaroo and Koala sanctuary. They are kept free in this sanctuary area, and visitor can keep up with them or even pet them (Figure 5).

Figure 4 With Krakatoa Melbourne's Footy team member



Figure 5 Brighton beach and its summer huts (left) and Wallaby petting in Maru Koala Park (right)

In summary, I would like to thank Tokyo Tech's AOTULE program for giving me this opportunity. I am sure that the research I conducted there will be beneficial not only for my research, but also for bigger climate change community, especially in tropical countries that have less climate change related research compared to other subtropical countries. Also, AOTULE gives me opportunity to explore Victoria, Australia and learn about Australian way to live and work.